JPRS 78639

30 July 1981

Japan Report

No. 131

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 78639

30 July 1981

JAPAN REPORT

No. 131

CONTENTS

MILITARY

Missile Programs for Immediate Future Examined
(JPE AVIATION REPORT-WEEKLY, 15 Jul 81) 1

JDA Considering Japan-U.S. Joint Study on Patriot SAM
(JPE AVIATION REPORT-WEEKLY, 8 Jul 81) 6

ASDF To Request Four C-130H's in FY '82
(JPE AVIATION REPORT-WEEKLY, 15 Jul 81) 8

AH-1S Procurement Program Set for July
(JPE AVIATION REPORT-WEEKLY, 8 Jul 81) 9

GSDF To Request 50 Percent Rise in Ammunition Funding
(JPE AVIATION REPORT-WEEKLY, 8 Jul 81) 11

Briefs
- Antisubmarine Warfare Helicopters 12
- New Destroyers for MSDF 12
- Transport Helicopter Selection 12
- Training Support Aircraft Request 12

SCIENCE AND TECHNOLOGY

Opening of Office Automation Age
(DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY, No 162, 1981).... 14

General Purpose Computer Industry Examined
(DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY, No 162, 1981).... 18

Recent Trends in Office Computer Industry
(Norikazu Shinozaki; DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY, No 162, 1981) 20

Production Trends of Electronic Components
(DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY, No 162, 1981).... 24

Activities of Electrotechnical Laboratory Described
(Hisao Tanou; DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY, No 162, 1981) 26

Advisory Body Studies Private Takeover of Nihon Aeroplane
(JPE AVIATION REPORT-WEEKLY, 8 Jul 81) 29

Tenryu Industries Awarded ANA's Order for 767 Seats
(JPE AVIATION REPORT-WEEKLY, No 529, 8 Jul 81) 30

TR&DI To Request Funds for Drone Development
(JPE AVIATION REPORT-WEEKLY, 8 Jul 81) 31

Marine Spey-Olympus Combination Selected for New DDG
(JPE AVIATION REPORT-WEEKLY, 15 Jul 81) 32

Toshiba Named To Develop New Portable SAM
(JPE AVIATION REPORT-WEEKLY, 15 Jul 81) 33

TR&DI To Complete Evaluation of MT-X Proposals Soon
(JPE AVIATION REPORT-WEEKLY, 15 Jul 81) 34

Briefs

VSA Special Trainer 35

MILITARY

MISSILE PROGRAMS FOR IMMEDIATE FUTURE EXAMINED

Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 pp 4-9

[Text]

Prospects and problems related to procurement of new guided weapons for the three Japanese services are summarized as follows:

Air Self-Defense Force (ASDF)

SAM-X

The ASDF has been considering the Raytheon Patriot as the SAM-X new surface-to-air missile to replace the Nike-J system for the six existing SAM units. But a joint survey mission of the ASDF and Ground Self-Defense Force (GSDF), sent to the United States last spring, found that the Patriot will be released for Japan's introduction about two years behind schedule, forcing the ASDF to revise its original plan to launch a SAM-X procurement program in FY 1982 or 1983. It now intends to lengthen the service life of the Nike-J to make up for the delay in the SAM-X procurement while continuing study on the Patriot and the Nike-Phoenix, another SAM-X candidate. The Nike-J's service life will be lengthened by switching to license production of ground equipment parts from the past procurement from the United States. The ASDF wants the license production to be funded in FY 1982 (April 1982-March 1983) because the United States' supply is scheduled to discontinue in 1987 or 1988. It has already decided to name Nippon Electric Co. as prime contractor for the license production, which could enable the Nike-J to continue service over the next seven to 10 years. As to the study on the Patriot, the ASDF plans to conclude a memorandum of understanding with the U.S. government to obtain information and prepare a Patriot procurement program jointly with the United States. But the U.S.

government is expected not to accept such a joint study unless the ASDF adopts the Patriot as the SAM-X. Therefore, the ASDF is leaning towards possibly giving up the feasibility study on the Nike-Phoenix as another condidate. Although the ASDF thus favors the Patriot rather than the Nike-Phoenix, some quarters in the service have doubts over adoption of the Patriot whose development started as many as 15 years ago. They think the Patriot developed on the basis of old requirements may be inappropriate as the SAM-X which is designed to serve as the ASDF's mainstay antiair missile system for 20 to 25 years. They expect that if the Patriot is introduced, the ASDF would have to study its replacement at an early time. They also point to the high price of the Patriot. Procurement of Patriots for all the six ASDF SAM units through the U.S. Foreign Military Sales channel is estimated to cost more than ¥800,000 million, beyond the ASDF's financial capacity. Thus, the Patriot procurement, even if adopted, could be limited to part of the SAM units. These negative opinions indicate adoption of the Patriot may be conditional. Although the ASDF is basically leaning towards a request for funding of the joint study with the United States on the Patriot in FY 1982, twists and turns are expected before fixing the SAM procurement program.

Tan-SAM

The FY 1981 budget funds the first two sets out of 12 sets of the domestically-developed Tan-SAM short-range antiaircraft missiles which are envisaged in the FY 1980-84 Medium-Term Defense Program (MTDP). The ASDF is expected to request six sets in FY 1982. The new MTDP covering FY 1983-87, to be prepared by the end of the current fiscal year, may stipulate funding of more than 30 sets, including the four to be left over by the current MTDP.

Portable SAM

The FY 1980-84 MTDP envisages funding of 120 sets of the General Dynamics Stinger portable SAMs, of which only six were funded in FY 1981. In the FY 1982 budget request, the ASDF may earmark funds for 37 to 40 sets. The FY 1983-87 MTDP is expected to call for procurement of about 200 sets more.

AAMs for F-15Js

Funding of AIM-7F Sparrow and AIM-9L Sidewinder air-to-air missiles for the ASDF's F-15J/DJ fighters started in

FY 1980 under the FY 1980-84 MTDP stipulating 1,500 units each. The FY 1980 budget funded about 80 AIM-7Fs and about 160 AIM-9Ls, and the FY 1981 budget about 170 units each. In FY 1982, the ASDF is expected to request about 400 units each. The FY 1983-87 MTDP may envisage funding of more than 1,400 AIM-7Fs and more than 1,300 AIM-9Ls. Procurement is estimated to total more than 2,000 units each eventually as the ASDF intends to acquire perhaps 80 more F-15Js in addition to the currently authorized 100 planes, and use these missiles for the F-4EJ fighters as well. All the Raytheon AIM-7Fs, including the initial 80 units, are subjected to domestic license production with Mitsubishi Electric Corp. serving as prime contractor. As to the Raytheon/Ford AIM-9L, the initial 160 units are to be imported through the U.S. Foreign Military Sales channel. But the remainder is planned for domestic license production. The ASDF named Mitsubishi Heavy Industries Ltd. (MHI) as prime contractor for the AIM-9L production in early June. The firm is expected to sign a licensing contract with Raytheon soon. Of the AIM-9L's component parts, the guidance control section (GCS) and active optical target detector (AOTD) are not released for license production of the 170 units funded in FY 1981. But the GCS supposedly will be released in October 1982 or later.

ASM-1 for F-1

The FY 1980-84 MTDP projects funding of about 180 MHI ASM-1 antiship missiles for F-1 support fighters. Twenty-five units were funded each in FY 1980 and 1981. The ASDF is expected to request about 30 units in FY 1982, leaving about 100 for the FY 1983-87 MTDP. It expects about 150 units, including the leftover 100, to be funded under the new MTDP.

Ground Self-Defense Force (GSDF)

SAM-X

The GSDF's SAM-X new air-defense missile system is designed as the replacement for the Hawk. While considering the Raytheon Patriot as the SAM-X, it has planned to replace the basic Hawk for 4.5 GSDF SAM units with the improved Hawk during FY 1977 to 1981 and that for the remaining four SAM units with the SAM-X from FY 1982 to 1985. But its joint survey mission with the ASDF to the United States last spring found that it would not be able to introduce the Patriot before FY 1984 or 1985 instead of in FY 1982 as planned, leading it to review the SAM-X procurement program. The GSDF is now expected to continue to replace the basic Hawk with the improved type in FY 1982 and 1983. At the same time, the GSDF as well as the ASDF intends to obtain information on the Patriot under a memorandum of understanding with the U.S. government and conduct joint study with it on a possible SAM-X procurement program.

Tan-SAM

The FY 1980-84 MTDP envisages funding of 24 sets of the Tan-SAM short-range surface-to-air missiles for the GSDF. The service is expected to request eight sets in FY 1982 after six funded in FY 1981. Under the FY 1983-87 MTDP, it intends to purchase eight to 12 sets annually or a total of about 60 sets, including 18 to be left over by the current MTDP.

Portable SAM

The FY 1981 budget funds import of the initial 37 sets of the General Dynamics Stinger portable SAMs through the U.S. Foreign Military Sales channel for antiaircraft defense of the GSDF's tank and artillery units. The FY 1980-84 MTDP projects funding of 131 sets. The GSDF wants to have about 40 sets funded annually over the next few years, including FY 1982. It tentatively plans to acquire a total of 900 to 1,200 sets. The total could increase depending on a future review of a portable SAM deployment scheme.

TOW for AH-1S

The GSDF is expected to procure Hughes TOW antitank missiles through the U.S. Foreign Military Sales channel in parallel to deployment of the Bell AH-1S antitank helicopter whose funding will start in FY 1982. A standard AH-1S will be equipped with two four-shot launchers accommodating a total of eight TOW missiles. The GSDF wants to procure under the FY 1982 budget 22 AH-1S helicopters which will form, along with two aircraft purchased already for evaluation, 1.5 squadrons. Under the FY 1983-87 MTDP, it intends to procure 32 more to complete a setup of 56-aircraft fleet for 3.5 squadrons. The number of TOW missiles will be fixed in accordance with the AH-1S procurement schedule.

Model 79 SSM

The FY 1980-84 MTDP projects funding of 33 sets of the Model 79 SSM antitank/ship missiles. During FY 1983-87 under the new MTDP, about 40 sets are expected to be funded.

Maritime Self-Defense Force (MSDF)

Standard SAM

The General Dynamics Standard SAM has been selected for the MSDF's DDG guided-missile destroyers. The service will procure the missiles through the U.S. Foreign Military Sales channel in parallel to building of three new DDGs planned for funding under the FY 1983-87 MTDP.

Harpoon SSM

The MSDF plans to introduce the McDonnell Douglas Harpoon surface-to-surface missiles for three DDG guided-missile destroyers, eight DD destroyers, 10 to 12 DE escort frigates, five to seven submarines and six to nine PM-X torpedo boats which are expected to be built under the FY 1983-87 MTDP. The Harpoon missiles will also be mounted on existing destroyers in parallel to their fleet rehabilitation and modernization programs. They will be imported through the U.S. Foreign Military Sales channel.

Sea Sparrow SAM

The Raytheon Sea Sparrow SAMs have so far been used for DDH helicopter-equipped destroyers. In the future, they will be mounted on existing DDA antiair destroyers and new destroyers, including eight DDs to be built under the FY 1983-87 MTDP.

Harpoon ASM

The MSDF plans to introduce the McDonnell Douglas Harpoon ASM for the P-3C antisubmarine warfare aircraft. It is expected to seek funding of about 50 P-3Cs under FY 1983-87 MTDP in addition to 45 planes under the FY 1980-84 MTDP.

Stinger Portable SAM

The MSDF has adopted the General Dynamics Stinger SAM for defense of regional headquarters building, guard terminals and air bases, planning to request the initial 68 sets in FY 1984. Under the FY 1983-87 MTDP, however, it is expected to request some of them in FY 1983, one year ahead of schedule, and additional sets in the following years.

CSO: 4120/279

MILITARY

JDA CONSIDERING JAPAN-U.S. JOINT STUDY ON PATRIOT SAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 pp 5-6

[Text]

The Japanese Defense Agency (JDA) is considering a joint study with the United States on the Raytheon Patriot surface-to-air missile, a promising candidate for the SAM-X replacing the Ground Self-Defense Force (GSDF) Hawk and the Air Self-Defense Force (ASDF) Nike-J SAMs, so that funds for the study would be included in the FY 1982 budget request.

But some JDA sources insist that the agency should decide to adopt the Patriot as the SAM-X unofficially before the joint study, as the U.S. Army's decision on full-scale production of the Patriot, which will pave the way for Japan's introduction, is certain to be delayed until the spring of 1982. Therefore, whether or not the JDA will request funds for the joint study in FY 1982 is still uncertain.

The joint study is aimed at collection of detailed data about the missile, including its price estimate. In a similar effort, West Germany's Air Force has reportedly commissioned the United States to study its possible Patriot SAM procurement and deployment program.

As a result of a joint GSDF-ASDF survey mission to the United States last spring, it has been found that Japan could be allowed to introduce the Patriot in 1984, or later, far behind its original schedule. As a result, the GSDF intends to continue to replace its Hawk missiles with the Improved Hawk and the ASDF plans to take measures for lengthening the Nike-J's service life, while refraining from a decision on the SAM-X selection. At present, the GSDF is considering only the Patriot as a SAM-X candidate, while the ASDF is studying the Nike-Phoenix as well as the Patriot.

Under the circumstances, the JDA has yet to conduct sufficient study for the SAM-X selection. If the JDA is forced to decide on the selection before the joint study with the United States, it could be faced with difficulties. However, unless the JDA settles the SAM-X selection problem at an early time, it could have to give up putting a specific SAM-X procurement program into the FY 1983-87 Medium-Term Defense Program which is to be prepared by the end of the current fiscal year (March 1982).

CSO: 4120/278

MILITARY

ASDF TO REQUEST FOUR C-130H'S IN FY '82

Tokyo JPN AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 pp 3-4

[Text]

The Air Self-Defense Force (ASDF) is expected to request four Lockheed C-130H Hercules transports in FY 1982 and six in FY 1983, after two already funded in FY 1981, in order to acquire 12 aircraft by the end of FY 1986.

The Defense Agency will conclude a contract with the U.S. government in July or August to purchase the two C-130Hs funded in the current fiscal year through the U.S. Foreign Military Sales channel. The FY 1981 budget includes ¥11,693 million for the contract.

The two aircraft will be delivered to the ASDF in December 1983 for practical and operational tests in 1984 and deployment at ASDF transport squadrons in 1985. In parallel to the acquisition, the ASDF will comission the U.S. Air Force to train crewmen and maintenance personnel for the C-130H from FY 1982 to 1983. Their domestic training is planned for FY 1983-84.

The ASDF intends to take delivery of the subsequent four aircraft in FY 1984, if they are funded in FY 1982. The remaining six planned for funding in FY 1983 are expected to be delivered in FY 1985 and 1986.

In addition to the 12 aircraft, the ASDF may request two to four more C-130Hs as reserve aircraft in FY 1984 or later.

CSO: 4120/279

MILITARY

AH-1S PROCUREMENT PROGRAM SET FOR JULY

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 pp 6-8

[Text]

The Japanese Defense Agency (JDA) will decide whether to procure the Bell AH-1S antitank helicopter through domestic license production by the end of July as it plans to incorporate some AH-1Ss into its FY 1982 budget request in late August.

It will work out a final AH-1S procurement schedule simultaneously with the decision because whether to produce the AH-1S under license depends on the number of the helicopters to be procured for the Ground Self-Defense Force (GSDF).

If the number is fixed at more than 50 aircraft as requested by the GSDF, license production would be adopted in the interest of smooth parts supply after deployment. If the number is less than 20 aircraft, however, direct import would be more sensible.

The GSDF intends to use the antitank helicopters for joint missions with its tanks. It has already procured two AH-1Ss for evaluation in accordance with the FY 1980-84 Medium-Term Defense Program. Its operational study using the two has ended, paving the way for the service to request funding of the helicopters in FY 1982.

The GSDF wants to procure 54 AH-1S helicopters in addition to the two it now has for evaluation, envisaging 3.5 AH-1S squadrons, of which three are designed for regional army headquarters and the remainder for training. In FY 1982, it intends to seek funding of more than 20 aircraft. But the JDA has yet to finalize its AH-1S procurement schedule, which also has a bearing on other equipment procurement programs.

Domestic aircraft manufacturers, including Fuji Heavy Industries Ltd. (FHI), are paying attention to the JDA's in-house deliberation over the AH-1S procurement program, hoping for a license production contract which would be worth more than ¥50,000 million. The AH-1S's price is estimated at ¥1,000 million per helicopter.

If the JDA adopts the license-production route, the prime contract would certainly be awarded to FHI, which has produced other helicopters under Bell license and which assembled the two AH-1S's for evaluation.

Avionics manufacturers also expect contracts for the production of electronic communications systems for the AH-1S, including the AN/ARC-164 UHF-AM, the AN/ARC-115 VHF-AM, the AN/ARC-114A VHF-FM, the C-6533/ARC ICS, the AN/ASN-43 gyro equipment, the AN/ARN-89B ADF, the AN/APX-100 IFF, the AN/ARN-128 VOR/LOC/G[illegible], the TSEC-KY-58 privacy communications system, the KIT-[illegible] TSEC Mode-4 computer, the AN/APN-209 radio altimeter, and the AN/ARN-128 Dopplier radar.

The GSDF is considering replacing some outdated models of these systems with domestically developed models based on its own avionics configuration for the AH-1S. Specifically, it intends to adopt domestic models for the privacy communications system and the Model 4 computer.

Possible contractors for AH-1S avionics systems include Mitsubishi Electric Corp. for the UHF/VHF systems and ADF, Japan Radio Co. (Nagano) and Toyo Communications Equipment Co. for the ICS, Tokyo Keiki Co. for the gyros, Toyo communications for the IFF, Toshiba Corp. for the VOR systems, Japan Aviation Electronic Industry Co. for the radio altimeter and Mitsubishi Precision Co. for the Doppler radar.

CSO: 4120/278

MILITARY

GSDR TO REQUEST 50 PERCENT RISE IN AMMUNITION FUNDING

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 p 9

[Text]

The GSDF is expected to request about ¥64,000 million for ammunition procurement in the FY 1982 budget, a 50 percent increase over about ¥42,500 million in FY 1981, to boost ammunition stocks for improvement of its war-sustaining capability.

FY 1982's GSDF ammunition funding will include the 203mm long-range shell, a new item for the 203mm self-propelled howitzer whose procurement is to start under the FY 1981 budget. The shell will be imported from the United States tentatively under the U.S. foreign military sales system.

Ammunition procurement under the FY 1980-84 Medium-Term Defense Program (MTDP) is aimed at making up for a decline in stocks resulting from consumption for training which has exceeded procurement, and correcting the gap between stocks of higher-priced missile and rocket ammunition and other ammunition. In FY 1980 and 1981 or the first two years of the MTDP, more than 40 percent of the GSDF's ammunition funding target was achieved. The GSDF intends to hasten ammunition procurement in FY 1982 in accordance with the Defense Agency's plan to attain the MTDP equipment funding targets ahead of schedule.

CSO: 4120/278

MILITARY

BRIEFS

ANTISUBMARINE WARFARE HELICOPTERS--The Maritime Self-Defense Force (MSDF) plans to have about 50 HSS-2B antisubmarine warfare helicopters funded under the FY 1983-87 Medium-Term Defense Program (MTDP) to be prepared by the end of the current fiscal year, according to informed sources. It intends to request 11 HSS-2Bs in FY 1982 in addition to eight funded in FY 1980 and 1981 under the FY 1980-84 MTDP calling for funding of 46 aircraft. Thus, 27 aircraft will be left for the new MTDP. The MSDF expects that about 50 aircraft, including the 27, will be funded at an annual rate of more than 12 aircraft under the new MTDP to attain a target inventory, although ASW helicopter funding is likely to shift to the SH-X from the HSS-2B late in the new MTDP term. The HSS-2Bs will join or replace existing HSS-2s/2As for ASW mission on destroyers and ground bases. The HSS-2B, an advanced version of the HSS-2/2A, is designed as the MSDF's mainstay ASW helicopter for the immediate future. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 p 8]

NEW DESTROYERS FOR MSDF--The MSDF is expected to request six destroyers in FY 1982 and four in 1983 in order to attain a destroyer funding target of the FY 1980-84 MTDP one year ahead of schedule. The six to be included in its FY 1982 budget request in late August may be five DD and one DE escort destroyers. But the destroyer funding request could be coordinated with other requests especially for P-3C antisubmarine patrol aircraft. Therefore, some of the planned DDs may be replaced by lower-cost DEs in the request. Funding in FY 1982 is seen as being an important step for the advanced attainment of the FY 1980-84 MTDP target. The four vessel planned for FY 1983 funding are one guided-missile equipped DDG, one DD and two DE destroyers. Priority may be given to the DDG. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 p 8]

TRANSPORT HELICOPTER SELECTION--The ASDF intends to select a new transport helicopter in FY 1982 for introduction starting in FY 1983, following procurement of C-130H transports for long-haul transportation. Although it would be desirable for the ASDF to adopt the same type as its KV-107 rescue helicopter for the new transport rotary-wing aircraft, the KV-107's payload is considered insufficient. A larger helicopter may be suitable for carrying materials from air bases to radar sites and other places without runways. A possible candidate is the Boeing Vertol CH-47 Chinook which the GSDR intends to adopt as its transport helicopter replacement. The ASDF is expected to select the CH-47 after the GSDF's final adoption. Besides the type selection, the ASDF will fix the number of the new transport helicopters for its procurement. The number, now estimated at 10, could be fixed at 15 depending on results of the ongoing work on the FY 1983-87 Medium-Term Defense program. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 pp 9-10]

TRAINING SUPPORT AIRCRAFT REQUEST--The MSDF has decided to postpone its request for three training support aircraft until FY 1983 because its work on selection of the aircraft is likely to take more time, according to informed sources. As a result, it will revise its original plan to request them in FY 1982 under the FY 1980-84 Medium-Term Defense Program (MTDP). A target inventory for the aircraft may be fixed at six planes under a new MTDP covering FY 1983-87. The training support aircraft is planned as a twin-jet plane equipped with target towing, scoring and other components to support antiaircraft and electronic warfare training of MSDF fleets. Its performance requirements include high speed and long flights. Candidates for the MSDF's support training aircraft include the Gates Learjet 35 series and the Dassault-Breguet Falcon 20 as well as the MHI MU-300. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 p 10]

CSO: 4120/279

OPENING OF OFFICE AUTOMATION AGE

Tokyo DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY in English No 162, 1981 pp 5-9

[Text]

The Dawn of OA Age

From the 13th through the 17th of May this year the 56th Business Show was held at the Harumi Exhibition Grounds in Tokyo. The features of this year's show were an increase in the number of companies displaying word processors to 21 and the popularity of the small business and personal computer corner, where the major manufacturers displayed numerous new products. The future growth of the Office Automation (OA) market is an area that Japan's computer, office equipment, and communications equipment manufacturers have great hopes for; however at present the concept of OA is a hazy one, with prospective users not sure in many ways what purpose they should follow in installing OA equipment or how effective it would be once installed. In October last year at the IFIP Congress '80, held in Tokyo, Professor H. L. Morgan from U.S. emphasized the need for further research into:

1) user-machine interface design
2) functional integration
3) distributed intelligence
4) communications
5) influence on organizations and society
6) knowledge required for management, etc.

However, experienced users on the whole already feel that based on this concept OA should be expected to cover decision making and questions involving judgement as well as routine office works.

OA can be roughly classified into three stages. The first stage is one where single machines such as small business computers, word processors, facsimile machines are used independently of each other. At the second stage these machines are organically coordinated, while at the third stage they are integrated with communication equipment at a high level of systemization. We are at present at the first stage, and the advance to the second stage depends on accurately assessing the user's situation and needs. In order to develop their products and increase sales in the future, OA equipment manufacturers are making such moves as reshuffling their organizations and setting up model offices (Toshiba and Mitsubishi Electric), while NEC is carrying out a project to accumulate know-how on OA use among some 50 collaborating user companies, with the information thus gained gathered in the C&C (Computer and Communications) system headquarters as its division for promoting office systems. This plan is designed to answer future OA needs.

Manufacturers' Ideas about OA

The first step required in furthering OA effectiveness is for computer manufacturers to take the lead in developing and manufacturing OA equipment. In addition to their existing sales campaigns for general-purpose computers, small business computers and microcomputers, they are leaving us stone unturned in their efforts to make survey and develop the market for OA, the probable leader of the future. In the spring of 1980 Toshiba, in response to increased recognition of the importance of OA by top executives of users, formed an operations planning department for office automation, and reorganized this division and established an office automation operations control department. For Toshiba, demand was dramatically touched off by the JW-10 Japanese language word-processor, the BP-100 microcomputer, and the Tosfile image graphics memory file, and Toshiba is depending on four elements as the cornerstones of its future progress in OA: the automated office, with a high level of automation (initial "A"), based on business machines ("B"), communications systems ("C"), and data processing systems ("D"). Moreover, within the corporation, in order to lay the foundations for the coming OA age, they finished the EPOC (Engineering Efficiency and Productivity of the Coming Age) campaign which realized a saving of 9,100 million yen to the company in a year and a half and initiated the POWER (Program for Office Work Efficiency Revolution) campaign to make office work more efficient.

Since the announcement of the *kanji* (Chinese character) small business computer on the market in the spring of 1980 by Mitsubishi Electric, the sale of small business computers to big enterprises has increased markedly. Because it was difficult to popularize the use of the small business computer among the various sections and departments within corporations, one Mitsubishi executive called 1980, when the *kanji* computer went on sale, the first year in the OA age. Meanwhile, at NEC last May, in order to further strengthen its basis for advancing C&C as its announced business concept, it established new organizations to deal with C&C related project: a C&C promotion planning group, and a head office for the promotion of C&C business system. The latter, in addition to coordinating the range of C&C systems in the field of business within the OA concept, is also responsible for such areas as office systems, the arranging and furthering of special projects, market development and supporting sales.

On the other hand, promoting the OA concept to integratedly process numerical data, non-numerical information and voices in offices, Fujitsu is concentrating on combining its individual products or equipment to build up a system by utilizing its experiences as a main framer. A big factor in the promotion of OA was the unveiling in April 1979 of the JEF Japanese language system, with its extension in May 1980 to small sized general purpose computers and small business computers, terminals, and the addition in February of this year of a function for interaction, and a Japanese language retrieval and output function. This JEF is capable not only of data processing but of processing of text and graphics as well and represents a realization of the integration of data processing and word processing. Fujitsu in June 1980 established an OA equipment sales promotion department under the direct control of the Management Committee to concentrate the OA equipment sales effort. The policy is to consolidate OA equipment under the "OASYS" brand, initially used for the OASYS 100, which introduced Japanese language and processing. In July the OA sales promotion department will expand to become a separate OA marketing company to meet increasing OA demand.

At Hitachi, under a three-year plan starting in 1978 a new "high-mix" plan (linking all business offices and manufacturing plants on-line and carrying out a unified processing of on every category from business operations to shipping) and a "simple-and-speedy" campaign (a plan to speed up office work by having intra-office reports limited to one page per subject and the answer delivered within the same day) has carried out with very good results. In addition to this kind of campaign within the corporation and a more positive approach to the use of computer to promote it, OA is brought closer to realization through more user oriented systems in terms of interaction between humans and the systems.

Oki Electric in July of last year established a strategy engineering staff directly under the president. Sharp has responded to the OA tide by increasing its production, but rather than producing complete OA systems, the company has divided to concentrate on the sale of the stand-alone equipment.

Characteristics of OA Related Products

The word processor – Beginning in September 1979, when Toshiba put out the JW-10, all manufacturers responding to the increase in demand and wanting to make any improvement possible in their positions in this highly promising market, have been engaged in fierce competition in both product development and sales. At last year's Business Show, Fujitsu, NEC, and Oki Electric unveiled new products, with Matsushita Communication and Canon following in the fall. Again this year in April, Hitachi and Mitsubishi Electric entered the field of Japanese language word processing, both with systems at the 2 million yen level. Hitachi's BW-20, with an alternative inputting function that marked an industry first, had the distinctive feature of offering a *kanji* tabulator or a two-way keyboard, and giving the user a wide selection. Among the machines featuring Japanese language input, (1) conversion of words in the Japanese syllabary; *Kana* to *Kanji* (Toshiba, Fujitsu, Canon, Mitsubishi Electric) and (2) keyboard or touch-pen (Sharp, NEC, Pentel, Oki, Matsushita Communication, Hitachi) are the main features, but Toshiba is scheduled to put out a machine with voice-inputting.

Character and voice recognition – In October last year NEC put out an OCR for the N6370S, capable of handling 25 A4 sheets (30 characters x 10 lines) per minute, at the low price of 12 million yen; and in February this year they brought out the DP-200, with a specific voice inputting (handles 50 consecutive words, or 150 if expanded), at less than 5 million yen. Again, a voice response system whereby a push-button phone is used to access the computer and inputting data, with the outputting results being given in voice form is being used by banks, wholesalers, manufacturers (order entry), etc., in addition to Hitachi and NEC, Fujitsu, Toshiba, and Matsushita Electric are beginning to expand rapidly into this field.

Others – Among the products whose release has led to the promotion of OA, we find NEC, in October 1980, putting out an integrated system for secretaries called the "Cybernetic Secretary System (CSS)" (integrating a CRT display, telephone, microcomputer, electronic mail, etc.), followed in November by an interval optical-fibers data communications system, the 'N6770' (a network connecting several computers and terminals within the company by optical fibers capable of sending data at high speed), Hitachi's "CORAL" (a system which automatically converts standardized Japanese to COBOL), which attracted a lot of attention at the 1980 Data Processing Joint Exhibition; and the "OCR-facsimile system" (can input directly into a computer by means of OCR handwritten facsimile reproductions it receives), perfected by **Matsushita Communication**.

User requirements

Japan's computer manufacturers have the advantage of being able to confine themselves to satisfying users' requirements speedily and precisely, because they have, in general, high capability to apply computer technologies to communications equipment, industrial machines and home electric appliances, which they, as all-round electric and electronic makers or communications equipment makers, have cultivated today's high level of technical development and achieved their growth in the process of ever-increasing demands for information processing equipment.

For Japan's OA, one of the main problems is now to efficiently process Japanese language data. Paper works involving letters, contracts, estimates, and invoices, reports, the preparation of technical manuals, etc. play a big part in routine office work and there is a real need for a machine with interactive dialogue in natural and free from misunderstanding, and capable of data transmission, retrieval and processing. In addition, with the internationalization of business, demand is increasing for automatic two-way translation of Japanese and various foreign languages among the steel, construction and chemical industries, as well as in the field of plant engineering.

On the other hand, there is a widespread expectation among enterprises that the promotion of OA will contribute not only to office efficiency, labor saving and general cost reduction, but to the improvement of the level of decision-making and the quality of management, in other words that it will help develop new opportunities in business. The small business computer, word processor, and facsimile unit have all recently come to be widely used for processing in the individual departments and sections of large companies, for all kinds of simulation, and even in the field of education. Even in smaller enterprise, where the use of small business computers has not yet been considered, so-called "personal computers" (desk top computers) played an important role as a step toward OA by demonstrating the power of the computer, but the requirements as to function and performance on the part of OA users are expected to increase. Various examples could be given, but the following applications are increasingly coming to be used. Ducuments writing, data transmission, the 'intelligent work station' for conferences, multiple-function word processors, and providing a visual information system for offices; electronic data exchange among individuals by using PABX data exchange reducing the amount of paper work; the storing and updating of data on the daily business, such as incoming order, data entries, inventory, payment, etc. which are instantly recorded on portable terminals; the use of computer graphic systems in the fields of planning, surveys, research, designing, and engineering to extend human creativity; establishing the various kinds of data base required for OA, storing a mass of office data as a data base for reference in step with soaring memory capacities; data inputting from outside data banks and data exchanging with data bases of other enterprises. In Japan it is expected that this data bank industry will flourish in the 1980's and its applications become standard. As this picture of the future materializes, along with an improvement in clerical output and the saving of labor, the quality of management will be raised and greater creativity displayed.

Technology required of OA

The Agency of Industrial Science and Technology, MITI has been promoting a "pattern information processing system" under a large-scale ten-year project which started in 1971, and the results were recently published. Some applicable examples might be a streamlined patent information retrieval system, a Japanese syllabary *(Kana)* – *Kanji* conversion system using OCR's, a high-speed processing system for hand written statistical data, a voice-inputting system for making seat reservations by telephone, a system for recognizing objects, etc. The technology of these systems will have a very great influence on OA.

Another MITI project is the fifth generation computer system, expected to be ready for use in the 1990's. The results of the research carried on over a two-year period, 1979–80, have been published and the project has moved to the stage of establishing concrete research and development measures. It will be a knowledge information processing system based on a high-level problem-solving function, overcoming the technical limitations of the computers.

In those systems, intelligence will be greatly improved to help human being, and the man-machine interface will become closer to the human system than conventional systems. Its overall capabilities will include 1) problem description and comprehension of requirement specifications, (2) synthesis of processing procedures, (3) optimization between machine system and processing procedures, (4) response synthesis based on output from machine, and (5) intelligent interfacing functions for understanding speeches, images, natural languages, etc. Moreover, the knowledge base supporting this fifth generation system is to include (1) knowledge for natural languages to be used for man-machine communication, (2) knowledge relating to the problem areas to be solved, and (3) knowledge relating to the machine system.

Fundamental application systems envisioned by the project encompass machine translation, question-answering, applied speech understanding, applied picture and image understanding, applied problem solving. When applied in the area of OA as well as in other area of knowledge information processing systems, these will without doubt make a major contribution to society. By providing computers with the capability to learning, associating and inferencing, the function of OA will no longer be limited to simply that of increasing the efficiency of daily work but will be extended into such new areas as judgement and consultation.

In considering the introduction of OA into business, it seems clear that a leading role should be played by the larger companies. It is precisely such companies, however, where strong resistance to rapid and large-scale introduction of OA is most likely. The larger a firm is, the more conservative it is likely to be regarding the introduction of changes in the organization and the management system and of new facilities, so that there is apt to be an aversion to any changes in the organization that lead to the elimination or combining of company divisions, changes in personal structure, revision of company rules and regulations, replacement of machinery and facilities and changes in what are considered required skills. On the other hand, a considerable number of small and medium sized firms have actively developed OA and in the process succeeded in streamlining the operations of indirect sectors. This implies that in their development of OA equipment the manufacturers should give adequate thought to the actual situation in the business world so as to pin down what the real user needs are. Then, once this has been done, they can proceed to fulfill their important role of leadership by creating the seeds for progress in OA through the development of the basic technology required for meeting these needs.

CSO: 4120/282

SCIENCE AND TECHNOLOGY

GENERAL PURPOSE COMPUTER INDUSTRY EXAMINED

Tokyo DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY in English No 162, 1981 p 10

[Text]

Since NEC's announcement of its world's fastest model branded "ACOS-1000" last fall IBM and Hitachi marketed their very large-sized computers in succession.

It can be said, however, that "the competition for development of the world's fastest computer" has been completed for the time being after Fujitsu announced its new type, "FACOM M-380" in late May.

In the future, the focal point will be shifted to how each manufacturer can sell its newest model to users.

In September 1980, NEC marketed the world's largest, fastest general purpose computer named "ACOS 1000" which operates at speed of 15 MIPS and possesses the world's biggest main memory capacity of 64 megabytes in that time.

It is said that NEC's advanced production technique for very large LSIs and its application technology on computers has resulted in such an outstanding product.

Two months later in November 1980, IBM put on sale the "IBM 3081" as the forerunner of its super large models so-called "H Series" which had been rumored as the "dream" type for a number of years.

This model has a double-headed CPU with a main memory of 32 megabytes and is said to operate at 10.7 MIPS. Its cost performance is more than twice as much as IBM's biggest type "3033 Model."

Japanese parties concerned focused attention to the fact that the new machines' pricing had been set at a comparatively low level.

About that time, the Amdahl Corp. in the U.S. announced a highly efficient model (580/5860) which surpassed the 3081 Model. This indicated as 1980 drew to a close that development of large sized models would be stepped up in the future.

It must be pointed out here that there was no immediate movement among Japanese makers to develop a counter model against the 3081 Model as in the past.

They took an attitude of "the existing models are capable of competing with the IBM product in performance."

This stand can be attributed to the fact that in addition to Japanese makers' advanced technology, even IBM has begun leveling off its development of new models based on latest techniques.

Nevertheless, Hitachi and Fujitsu have been steadily proceeding with R & D efforts. In February 1981, Hitachi announced its top-level model, "M-280H," in the M series. The model is the world's fastest machine now on the market which can be equipped with a maximum main memory of 32 megabytes and a total of 32 channels together with a cache memory which is 50 per cent faster than the existing top model, "M-200 H."

Fujitsu also put on the market in late May its world's largest and fastest computer, "FACOM M-380" and "FACOM M-382" whose maximum main memories are respectively 64 megabytes and 128 megabytes. The M-380 Model possesses one unit of CPC which is considered as an engine for calculating functions while the M-382 Model has two units.

As a result, the M-380's processing speed is about 2.4 times as fast as Fujitsu's hitherto largest model "M-200" while that of the M-382 is approximately four times faster than the M-200.

Besides, new techniques have been adopted for their logical circuits.

In this way, all major models have appeared on the market both from Japanese and US manufacturers and strong competition is expected to win orders among the makers starting in June when Japanese Government circles select large-sized computers to be installed with next year's budget funds.

It can be said that race to win orders has already started because IBM which has lagged behind Fujitsu in its computer sales in Japan, established a sales company in June which specializes in government sales, in recognition of the importance of government orders and because of reflection of the fact that IBM had been taking a superior attitude during the "period of selection."

Some computer makers predict that there will be a greater demand for large-sized computers among major banks and government agencies because of increasing data volumes to be processed by computers. ■

CSO: 4120/282

SCIENCE AND TECHNOLOGY

RECENT TRENDS IN OFFICE COMPUTER INDUSTRY

Tokyo DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY in English No 162, 1981 pp 11-14

[Article by Norikazu Shinozaki, Chief Researcher, Nippon Administrative Management Association]

[Text]

What are called small business computers, smaller computers, and desk-top computers in Europe and the U.S. are generally referred to as office computers in Japan. The Ministry of International Trade and Industry divides computers into various categories but they do not include the office computer, which is defined as having a selling price of 20 million yen or less by the Japan Information Processing Development Center, a non-profit industrial association.

In addition, the personal computer has gained considerable attention in Japan as well as the U.S. It is compact and inexpensive, and as its name indicates it can be purchased by an individual and used for hobby and technical calculation purposes. Statistics on the number produced and the number of companies manufacturing them are not reliable and the whole situation in this area is somewhat foggy.

The attached table gives the procurable data on office and personal computers, from which it is obvious that sales of office computers are climbing rapidly. It seems likely that the combination of comparatively low price and high performance will be the major selling point in the future.

Uses of the Office Computer

Of the office computers, the best are comparable to big computers in performance while the machines at the bottom of the scale are most effective when applied to specialized functions, and rather than as computers, or system machines, their use as specialized machines is recommended.

While there are differences in the work handled by the bigger and the smaller machines, there are also differences in the way they are operated.

Office Computers Classified According to Their Use

Large corporations are already using fairly big computers, and the expectation that one machine will be able to handle all the company's requirements has proven a stimulus to their use— the idea of concentrated application.

The same is true of office computers. It is common practice to use a powerful one to handle all the needs of the enterprise. The large memory capacity of these computers makes them almost equal to the big computers. Thus along with the possibility of the use in medium-sized enterprises of comparatively large-scale systems, the programming can be done in one's own company wherever the company can afford a trained computer staff.

With the huge amount of data to be handled by large-scale enterprises the use of big computers is inevitable, but because of this volume a certain amount of nearly worthless data will be included and useless output requested. When a computer is overloaded, malfunctions will occur and the machine will be incapacitated, with such widespread consequences that it may even be necessary to suspend business operations temporarily.

To avoid this, the idea of using office computers in each section to handle its own data has spread, with the ing computer reserved for data essential t[illegible]ations of the company as a whole. The office com[illegible] in this case must be one with an intelligent terminal in to which data can be input through the keyboard and displayed in table or graph form. This is the function of the office computer of the future, and its terminal will be able to transmit data needed by the corporation as a whole either on-line or off-line to the central computer. While large enterprises will use these medium and large systems, where small-sized enterprises use the smaller systems they will tend to use them for priority work.

As the memory capacity of these smaller systems is limited, a complex program will take up much of it, leaving little capacity for data input, while a vast amount of data to be processed will leave only enough memory capacity for a simple program.

Of course memory can be expanded to make room for any quantity of data required, but as this expansion is an expensive proposition it is unlikely to be within the means of a company which could initially only afford a small system.

It is therefore probably unavoidable that these small-sized enterprises tend to use their smaller systems for one or two specialized functions only.

Applications of the Office Computer

Let us now examine those cases where different sections in large enterprises are to use different small systems or smaller enterprises where there is a pressing need for computerization. The most important market for office computers in Japan is the smallest enterprises. They are by far the most numerous, and because of Japanese business practices and the characteristics of the distribution system they have up to now been the most resistant to change.

Most of the office computers being sold to the medium and small enterprises as well as those even smaller are in the small system class. Let us examine what kind of work they are used for.

From the data available it is clear that the main application of these office computers is in keeping track of sales. Obviously wholesale outlets are a good market for office computers, because of the complexity of the distribution system, as mentioned above, and the difficulties in handling the paper-work for the diversity of merchandise and small quantities sold. The tabulation of daily sales volumes according to customers and to merchandise sold has finally reached the hand calculator stage, but the input of this data into [illegible] office computer gives instantaneous results. It can even print the customers' bills. At the same time, using this sales data the computer can keep track of inventory, keeping it at the most suitable levels by specifying the dates for ordering new merchandise.

Where there are many kinds of inventory goods or the movement of stock is brisk, and again where the office computer is expected to handle the entire burden of paper work, a considerable memory capacity will be necessary. Thus it will sometimes be best to use the office computer exclusively for inventory control. Naturally a medium-sized or larger system can handle both sales and inventory by merely expanding the memory.

After sales accounting the next most common use for the office computer is the handling of finances. With the input of sales receipts, daily and monthly statements of accounts are easily produced, and with a somewhat more complex program balance sheets, profits and loss statements, and other financial reports can be generated as well. Software with these features is sold in large quantities.

Formerly, it [illegible] fairly difficult for an office computer to specify when sales receipts would produce income or should be credited as accounts receivable, but with the improvement of both hardware and software this kind of cancellation accounting is easily accomplished.

The office computer can also handle payroll accounting for an enterprise's employees. There are various methods of calculating pay, but in other than exceptional cases, each employee's regular pay, overtime and holiday pay, special allowances, etc. are a simple matter for a computer program.

Number of Office Computer Manufacturers

Japanese manufacturers	47
Foreign manufacturers	20
OEM manufacturers	17

Note: Those figures include manufacturers who have stopped their production and sales

At the end of the year, the stored up monthly totals will easily give the figures necessary for tax purposes. In the past, because of the complexity of the Japanese tax system tax accounting was a real headache for the employees responsible and the office computer with tax calculating software is a godsend to them.

Other users of the office computer include the company president, who may use it for his own hobby interests, developing his own programs. Quite a few of these have been given to software makers, improved on and retailed.

Package Programs for the Office Computer

Obviously some form of software is essential for the operation of any computer, and as the office computer has a limited memory capacity there is therefore a limit to the amount of work it can handle.

The office computer manufacturers produce software designed to meet the various needs of users, the package programs, to use which the user need only input the relevant data to obtain the desired results. However in many cases the programs purchased do not answer the user's specific needs, generally because the user's office procedures differ slightly from those assumed in the standardized program. A difference in the products sold or in the type of customers dealt with can mean that a particular program intended for that line of business will not necessarily function properly.

In the food and textile lines the distribution systems as well as the types of goods, profit margins, purchasing methods and even the issuing of vouchers for returned goods are different.

Even in enterprises selling the same line of foodstuffs, such factors as the size of the business, peculiarities of the area served and ties with customers will differ, and in order to make the package program answer the actual requirements some adjustment in it may be necessary, or the manufacturer may need to prepare a custom-made program.

It is a peculiarity of computer use here in Japan that both the domestic and American made software for the larger computers is almost exclusively for statistical or technical calculations or language problems. Many of those for office use prove unusable however or can be used only after some form of program modification.

The number of office computers is much greater than that of the big computers, and as most of the enterprises using them are not large enough to employ a computer operator or programmer, the dependence on package programs is expected to increase in the future. The market is a large one but its needs have not yet been adequately fulfilled. The future of the office computer depends on the solution of these problems.

Installation of Office Computers by Fiscal Year

(Unit: set)

	Japanese made	Foreign made	Total
1971	1,019	1,225	2,244
1972	1,700	2,161	3,861
1973	3,004	2,233	5,237
1974	3,272	1,867	5,139
1975	2,495	1,138	3,633
1976	3,076	939	4,015
1977	–	–	5,396
1978	–	–	9,745

Future Trends for the Office Computer

The use of the office computer has expanded vastly here in Japan, and as was mentioned above, the chief reason is its use in simplifying office work in medium and small enterprises. In the future, the trend is expected to be spurred by improvement in performance coupled with lower prices as a result of better electronics technology.

Among new developments in computer use, the most conspicuous are the handling of Chinese characters, a problem not found in most other countries, and great progress in research into voice input.

The handling of Chinese characters in office work may not seem an important question, but in Japan this is expected to be a major factor in the future of the office computer. In order to display or print Chinese characters a dot matrix is employed, with points used to specify the complex strokes in output.

The principle is the same as in displaying the letters of the alphabet but because of the great number of dots involved the process of graphically displaying Chinese characters is much more complex; in theory at least any picture could be drawn using a series of these configurations. In the future, the fact that very low priced office computers too will be able to produce these specialized graphics should be a big selling point.

The other development, input of the human voice, means that the computer will be able to work at the command of the user's voice. The manufacturers are in the process of producing them on a trial basis and developing them, and provided that the user's voice has previously been "memorized" by the computer, the effort is already showing success. There are still many unsolved problems concerning software use but the idea of the user of the office computer inputting data without touching the keyboard has been realized.

The Office Computer and the Personal Computer

There is still much to be done in the future devleopment of the personal computer. There is the question of the development of VLSI and its cost, but it should take over a good part of the field of the office computer in the future.

In Japan today the office computer is thought of as a compact computer for office work while the personal computer is for technical calculations and hobby use. Many of these personal computers are sold for office use, and judging from price and capacity they can be classified as office computers. The time will come when, as their performance improves, these two types of computer will be classified together. ■

CSO: 4120/282

SCIENCE AND TECHNOLOGY

PRODUCTION TRENDS OF ELECTRONIC COMPONENTS

Tokyo DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY in English No 162, 1981 pp 24, 25

[Text]

Production Trends

The production of electronic components in 1980 amounted to approximately 2.6547 trillion yen or a major increase of 27.7 per cent over the previous year. There was vigorous demand for general electronic and active components both at home and abroad with supply-demand relations experiencing a generally tight situation.

The main reason for this situation was the doubling of VTR production over the preceding year as VTRs require three to four times more electronic parts than TV sets. VTR exports amounted to 1.3151 trillion yen in 1980 or an increase of 31.8 per cent over the preceding year.

General Electronic Components

The 1980 production of general electronics amounted to about 1.4276 trillion yen or a 24.7 per cent increase over the preceding year. Production continued at a high level from the second half of 1979. The supply-demand situation was generally tight since the beginning of 1980.

The principal reason for this situation was the increasing production of consumer electronics for the domestic market with VTRs acting as a driving force. According to industry sources, the domestic shipment of general electronic components for VTRs occupied over 10 per cent of the composition ratio in 1980.

The consumer electronics besides VTRs, used a smaller volume of parts because of high density of parts and the advancement of chip application. However, the circuits accompanying the advancement of electronic equipment have become more complex which has resulted in the halting of this trend according to the general views of component makers. The shipments of parts for consumer electronic equipment in 1980 increased by over 30 per cent over the preceding year.

Other industries which have contributed to sound parts production development include automobiles and cameras which have applied electronic techniques to a marked degree.

On the other hand, exports made a favorable showing with the total amounting to 792.3 billion yen or a 25.8 per cent increase over the preceding year. It is true that the effects of the depreciation of the yen during the first half of 1980 contributed to the good performance. However, it could be said that Japanese electronic component exports have expanded on a global scale because of economical and high quality products like the highly-appreciated consumer electronic products.

Active Components

The 1980 production of active components amounted to about 1.2270 trillion yen which was a major increase of 31.3 per cent over the preceding year. The greatest increase was recorded by the integrated circuit (IC). As a result, the IC occupies 46.5 per cent of the total active component production.

The production trend of the principal products follows:

Electron tube production has marked a great increase of 22 per cent, the highest in the past four years, amounting to 362.9 billion yen. This is because of a substantial contribution by the increased production of color TV cathode-ray tubes to which most weight is given among various electron tubes.

Color TV production surpassed the 10 million-unit level in 1980 for the first time in four years and has recorded an unprecedented high-level output of 10.92 million units.

Semiconductor Devices

The 1980 production registered an increase of 15.7 per cent compared with the preceding year, amounting to 293.9 billion yen.

Although semiconductor devices have been leveling off under the influence of IC trends, it showed a double-digit growth in four years as a result of the expanded production of VTRs in 1980.

Semiconductor devices during the whole year have caused a rapid increase of imports with the growth rate exceeding those of both production and exports.

Integrated Circuits

As mentioned before, integrated circuits have continued high-level production. The 1980 production recorded a 48.9 per cent increase over the previous year, amounting to 570.2 billion yen. In concert with rapidly increasing demand, each maker's equipment investment is showing a sharp increase.

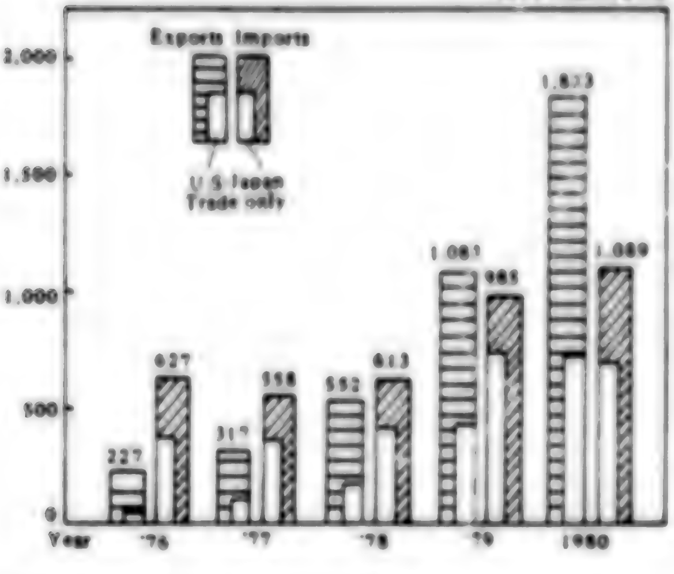
It is said that the investment amount has reached somewhere around 85 billion yen (10 major companies) by drastically revising the original level of 79 billion yen for FY 1980 through 51.3 billion yen in FY 1979 and 5.2 billion yen in FY 1975.

As regards exports, IC imports have usually surpassed exports during the past years but in 1979, exports of 108.3 billion yen surpassed imports of 98.5 billion yen and the total in 1980 was 183.3 billion yen and 108.9 billion yen respectively. It can be said that the IC industry has grown as "a member" of the export industry.

In addition, the Japanese side went into the black for the first time in 1980 from the viewpoint of the IC trade balance between Japan and the United States.

Export-Import Trends of ICs

(100 million yen)



Technological Trends

General Electronic Components

The standardization of general electronic components is a subject of great importance from the viewpoint of industrial progress. Therefore such standardization is being vigorously pushed ahead with through the efforts of the various component technology committees and committees involved in standardizing devices and parts.

Below are shown the major items standardized in fiscal 1980.

1) Forming dimensions for fixed resistors for consumer electronic devices.
2) Speaker plug terminals for consumer electronic devices.
3) Taping dimensions of electronic components (chip type).
4) Square chip resistors.
5) Multilayer condensers (chip type).
6) Network resistors.

Active Components

Semiconductor IC technology is advancing all the time. From last year attention has been focusing on 64 k bit RAMs, and the makers have now completed volume-production prototypes and are moving towards the setting-up of mass-production systems. Also, the results of research carried out by the VLSI Technology Research Association* is now being incorporated by the various companies and helping them to progress with the development of a 256 k bit RAM.

With the diversifying uses ROMs are now being put to, mask ROM and EP/EAROM processes and large-scale memories are being announced all the time.

Microcomputers and microprocessors are steadily consolidating their place in the market; in fact, 4/8 bit microcomputers are being introduced to the market. Moreover, including 16-bit and 32-bit development, progress is being made with the development of LSI for peripheral applications, and this is expected to become a mainstay electronics technology in the future.

Development of communications codex, A/D D/A converters and linear IC for industrial and consumer use is flourishing, and is proving of great benefit in the improvement and development of devices. ■

Note:

The VLSI Technology Research Association, non-profit organ., was established in March 1976, under the auspices of MITI, by five companies: NEC, Hitachi, Toshiba, Mitsubishi Electric, and Fujitsu, and its staff of over 100 drawn from the five companies and the Agency of Industrial Science and Technology conducted R&D on a joint basis up until March 1980.

The Association's objective was R&D aimed at VLSI which would form the heart of domestic computers and match IBM's Super-large Future System computer. Its results can be gauged from the fact that it has applied for more than 600 patents and has drawn attention from IBM and the major advanced nations of the world.

Source: Figures in the article are based on EIAJ.

CSO: 4120/282

SCIENCE AND TECHNOLOGY

ACTIVITIES OF ELECTROTECHNICAL LABORATORY DESCRIBED

Tokyo DIGEST OF JAPANESE INDUSTRY & TECHNOLOGY in English No 162, 1981 pp 27-30

[Article by Hisao Tanou, Group Leader, Research Planning Office, Electrotechnical Lab., Agency of Industrial Science & Technology, MITI]

[Text]

Position within Administrative R&D Organs

The Electrotechnical Laboratory, one of the experimental and research laboratories for carrying out research and development into science and technology related to mining and industry based on the Law on the Establishment of the Agency of Industrial Science and Technology, belongs under the Agency of Industrial Science and Technology (attached organization of the Ministry of International Trade and Industry) and is Japan's largest national comprehensive laboratory in the field of electrical and electronic research. The Laboratory's role within the nation's overall program to promote technology is to keep constantly abreast of the most advanced research and development throughout the world, promote the development of new technology seeds, and assist in the practical utilization of such new technology by private industry.

The Laboratory's budget for fiscal 1981, ending March 1982 consists of operating funds totaling about 5,200 million yen. Of this amount, 1,800 million yen is earmarked for R&D into new energy and energy-saving technology, 400 million yen for large-scale industrial technology research and development projects, 1,700 million yen for special research and development, 800 million yen for testing and experimentation, and 500 million yen for administrative and miscellaneous expenses.

The Laboratory staff numbers about 730 including approximately 570 research workers.

Established in a legal sense in 1891, the Laboratory's mission in the early years was related to experimentation and research in connection with the nation's electric power transmission and communications systems and to inspection and approval of electric meters. Following World War II, and after numerous reorganizations, the Laboratory made a major contribution to Japan's economic recovery in a number of areas, particularly through its pioneering work in the development of computers in Japan. In recent years, it has concentrated much of its work on projects at the cutting edge of technical advancement which have been shunned by private industry as involving too much risk.

The legally designated functions of the Laboratory are:

1) Experimentation, research and guidance in the fields of electrical engineering and electronics (including information technology);
2) The establishment and maintenance of standards for electricity, light, radiation (radioactivity) and sound, and the inspection, approval (by type) and testing of metering instruments.

The fields of research presently being pursued range broadly from basic electronics technology to energy technology, information technology, standards and metrology.

The following is an outline of the main areas of research.

Research and development in new energy technology

Dubbed the "Sunshine Project," this work stands side by side with that being carried forward in energy-saving technology (taken up in the following section) as one of the Agency's most important energy related programs. Although the project also encompasses comprehensive research into hydrogen energy, it centers primarily on solar energy technology. The focus in the solar energy R&D work is on electric power generation systems using solar heat and on photoelectric systems employing solar batteries.

The aim of the Laboratory is to find ways to make use of the world's clean and unlimited supply of solar energy by converting this energy into forms which are easy to use. Work is proceeding, for example, on the development of a compound system which is a combination of a system for generating electricity from high-temperature steam produced using solar heat and a system for supplying hot water, and on the development of amorphous silicon materials for use in the fabrication of high-efficiency photoelectric conversion elements at low cost.

Research and development in energy-saving technology

This work is being carried out under what is known as the "Moonlight Project" with the aim of increasing the efficiency of existing energy technology. One of the main fields of endeavor is in magneto-hydro-dynamic (MHD) power generation. Research into MHD systems was begun in 1966 and entered its second stage from 1975. The aim is to achieve an efficiency of 50 per cent in the generation of electricity with a compound system using an MHD system in the stage before a conventional steam-operated generation system. An experimental unit called 'Mark VII' has been completed in Takasago, near Osaka in western Japan, and will shortly be put to a test in the hope of achieving 200 hours of continuous operation at an output of 100 kilowatts.

Another important subject of the Moonlight Project is the development of superconductors. Numerous superconducting materials have already been discovered and several, including NbTi and Nb_3Sn, have been found to be adaptable enough to coiling and to have sufficiently high critical temperatures and magnetic field intensities to permit their practical application. Work is also going forward on Nb_3Ge and other new materials which are expected to demonstrate even better characteristics, as well as on testing of power transmission systems employing superconductors and on research into cooling systems and the production of cryogenic temperatures.

Large-scale industrial technology research and development

Two large-scale projects are in progress this year (1981): the R & D Project on a Flexible Manufacturing System Complex provided with high-performance lasers which aims at establishing the technology required for stable control of a high-power (20 W) laser and the R & D Project for Optelectronic Information Systems which is directed to establishing the basic technology required for an Optical Measurement and Control System taking advantage of the properties of light which make it adaptable to high-speed processing of large volumes of data and which develope integrated circuits for severe environments. Another project named the R & D Project on an Advanced Computer System for Scientific Technology is scheduled to get under way from the latter half of the year. The goal of this new project will be to develop an electronic computer having a high performance of 10 BFLOPS. Work is to proceed from both the side of computer system and the side of the development of new devices.

One device that is to receive special attention is the Josephson device.

Special research into electronics technology

This category covers fields ranging from electronic materials, electronic devices and data processing technology to power lasers, photoelectronics and metrological technology. Research is, for example, being made into the utilization in electronic computer devices of the Josephson junction to realize devices which operate on a fundamentally different principle from conventional semiconductor electronic devices and are thus expected to be far superior to conventional devices in terms of switching speed and power consumption. Progress already made includes the development of a system for conducting switching that is not based on the conventional method of generation of a magnetic field and the development of a new material which is more stable than PbIn.

In the field of photoelectronics, attention is being focused on the capability of light in parallel picture processing operations and success has been achieved in developing the basic technological seeds of an optical computer. In connection with data processing technology, on the other hand, a large-scale industrial project related to pattern information processing was completed in 1980.

realization of high performance computers which are easier for humans to use. This work includes research into non-Neumann architecture and new computers with built-in knowledge.

Research related to space and nuclear power

Achievements in the field of space include the ion engine built by the Laboratory and installed in the ETS-IV test satellite. Test operation of this engine went off smoothly. In the field of nuclear power, on the other hand, the Laboratory is now building the Troidal Pinch Plasma Experiment (TPE-II) directed to such fundamental aspects of nuclear fusion as the realization of high beta plasma and plasma analysis.

Research and development into fundamental technology for next-generation industries

This is a newly planned and established field of research which is to get under way from fiscal 1981. The aim of the Agency of Industrial Science and Technology in putting this program into effect is to promote research and development into fundamental technology which will be required in common by all technically advanced industries during the 1990's and in which the industries of Japan lag behind Europe and America. Although much of the R&D work will be consigned to private enterprises, the National Laboratories will also participate.

For its part, the Electrotechnical Laboratory will carry out a part of the research into new-function devices and new materials. The research period has been set at between 8 and 10 years. The idea is to get a head start in the development of basic technology related to subjects that are expected to assume particular importance in about that many years. Specific research areas will, by way of example, include three-dimensional devices, devices employing superb lattice structures, and ICs for severe environments, and organic materials possessing electrical conductivity on the order of metals. ■

Note:

The Agency of Industrial Science and Technology was established in 1948 to administer Japan's use of technology, thereby promoting the development of natural resources, the modernization of production methods, the upgrading of production technology, the standardization of industry, and the subsidization and encouragement of R&D in Japan's private sector. The Agency was also charged with the setting up of a system for comprehensive research and experimentation in the areas of mining and industrial technology in order to realize the above policies.

Its organization provides for the General Coordination Department and the Standards Department, which functions as its main offices, and sixteen attached laboratories and research institutes. Specifically, the Agency is responsible for the planning, dissemination and implementation of comprehensive policies related to MITI's administration of technology, and also the implementation of various experimental and research programs in response to social and administrative needs.

CSO: 4120/282

ADVISORY BODY STUDIES PRIVATE TAKEOVER OF NIHON AEROPLANE

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 p 4

[Text]

The Policy Subcommittee of the Aircraft & Machinery Industry Council's Aircraft Industry Committee will meet July 7 to study the private sector's takeover of the semi-governmental Nihon Aeroplane Manufacturing Co.'s (NAMCO) business.

NAMCO was founded in 1959 to manufacture YS-11 turboprop airliners. But the Ministry of International Trade and Industry (MITI) plans to dissolve the company by the end of FY 1982, as it has already suspended YS-11 production and is involved only in parts supply.

The subcommittee, an advisory body to MITI, has set up a task force, headed by Vice President Odamura of the Agriculture Forestry and Fishery Finance Corporation, to prepare recommendations on the takeover.

At the July 7 meeting, the task force will submit a report on the matter as a basis for the subcommittee's discussion. The subcommittee will have to hold one or two more meetings to hear requests for YS-11 product support business from airlines and other YS-11 users before finalizing its recommendations.

The advisory body will also start a full-scale study soon on Japan's aircraft development setup after dissolution of NAMCO.

CSO: 4120/278

TENRYU INDUSTRIES AWARDED ANA'S ORDER FOR 767 SEATS

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 pp 4-5

[Text]

Tenryu Industries Co. has been awarded a ¥300 million order by All Nippon Airways (ANA) for seats to be mounted on the first six of 40 Boeing 767s which ANA plans to introduce from 1983. The seats for ANA's first 767 will be delivered by October 1982.

The firm has won the order as a result of a fierce competition with foreign seat makers. It is expected to gain orders for seats for ANA's other 767s as well. The Japanese carrier has placed an order for 25 B-767s and an option on 15 with the Boeing Co.

Tenryu Industries, based in Gifu Prefecture, is noted for being the first aircraft seat producer in Japan. It launched development of seats for commercial transport aircraft when it entered a technical tie-up with Fairchild Burns Co. in April 1969. Its aircraft seat manufacturing started after the U.S. Federal Aviation Administration's permission was received in 1972. Although the firm developed the world's most lightweight aircraft seat jointly with ANA in 1978, the seat for the B-767 is even lighter than that. The three-man seat weighs only 53 pounds.

The aircraft seat manufacturer also received Boeing's ¥100 million order for 102 seats for three Boeing 737s. It is the U.S. aerospace giant's first direct order placed with Tenryu Industries.

Although the existing three-man seat for the 737 weighs 67 pounds, Tenryu Industries has successfully reduced the weight to 57 pounds. The number of parts per seat has also been decreased by 30 percent for easier maintenance.

CSO: 4120/278

TR&DI TO REQUEST FUNDS FOR DRONE DEVELOPMENT

Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 pp 9-10

[Text]

The JDA's Technical R&D Institute (TR&DI) is expected to request ¥1,800 million in the FY 1982 budget for development of a low-cost and highly maneuverable target drone for ASDF fighter aircraft's missile firing training.

It is now coordinating views with the JDA's internal bureaus on the new research and development program prior to the FY 1982 budget request in late August.

The ASDF plans to introduce the Teledyne Ryan BQM-35J target drone for F-15 fighters' exercises through license production by Fuji Heavy Industries Ltd. (FHI). But this drone is priced at as much as ¥150 million. Furthermore, maintenance of the recoverable drone is estimated to cost much money.

The new drone for the TR&DI's development will be cheaper even than the Chukar-II, valued at ¥30-to-40 million, for the MSDF's firing exercises of Sea Sparrow and Tan-SAM short-range missiles. It will also be disposable and highly maneuverable for programmed flights.

If the drone development program is funded, Kawasaki Heavy Industries Ltd. (KHI) and FHI are expected to vie for the prime contract. Candidates for the supplier of the drone's engine may be KHI and Mitsubishi Heavy Industries Ltd.

CSO: 4120/278

SCIENCE AND TECHNOLOGY

MARINE SPEY-OLYMPUS COMBINATION SELECTED FOR NEW DDG

Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 pp 1-2

[Text]

The Central Procurement Office of the Japanese Defense Agency (JDA) informed Kawasaki Heavy Industries Ltd. (KHI) in early July that it will award KHI a contract to supply the gas turbine engines which will power the 4,500-ton new DDG guided missile destroyer which will be funded this fiscal year.

The KHI - Rolls-Royce group has been proposing the combined gas turbine and gas turbine powerplant consisting of two Rolls-Royce Marine Speys for cruising with two Rolls-Royce Olympus engines for high-speed operation.

The deal, which could be worth many millions of pounds in future sales, not only to Japan but to other navies of the world, is the first export order for the Marine Spey and follows five years of negotiations by KHI and Rolls-Royce against very strong competition from American gas turbine manufacturers.

Rolls-Royce currently powers ships of the Maritime Self-Defense Force (MSDF) using Olympus and Tyne engines. These units are partially built under license in Japan by KHI.

The new engine, the Marine Spey, has been designed, developed and manufactured by Rolls-Royce at Ansty, near Coventry, England, under a British Ministry of Defense contract as a new fuel-efficient marine unit to power all types of naval vessels from 1,000 to 20,000 tons in displacement. It reportedly offers approximately a 25 percent saving in fuel consumption over previous marine gas turbines.

CSO: 4120/279

TOSHIBA NAMED TO DEVELOP NEW PORTABLE SAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 pp 2-3

[Text]

The Japanese Defense Agency (JDA) has named Toshiba Corp. as prime contractor for the development of a new portable surface-to-air missile using the image-homing guidance system which has yet to be used even in the United States.

The JDA's Technical R&D Institute (TR&DI) has so far let Toshiba and a group of Kawasaki Heavy Industries Ltd. and Nippon Electric Co. (NEC) compete for the portable SAM project since it launched the program in 1979. It has selected Toshiba after evaluating prototype systems fabricated by the contenders. Toshiba's prototype used both the infrared and image-homing formulas, while the KHI/NEC group's one used only the image-homing system. As a result of their tests, the TR&DI has concluded that Toshiba's system, excluding the infrared formula, is superior to the other.

The image-homing SAM has a so-called charge coupled device (CCD) on its noise to detect target aircraft. The CCD has so far been used for household videotape recorders and other consumer electronics.

The TR&DI has earmarked ¥1,700 million in the FY 1981 budget to develop the new portable SAM by FY 1983. Although the JDA is to import the General Dynamics Stinger infrared-homing portable SAM from the current fiscal year, it wants to introduce the domestically developed portable SAM in the latter half of the 1980s.

Toshiba thus takes the lead in image-homing missile technology thanks to the portable SAM program, which will have great effects on future competitions for missile development and production. Part of the guidance system for the portable SAM, by the way, will be fabricated by the KHI/NEC group.

CSO: 4120/279

SCIENCE AND TECHNOLOGY

TR&DI TO COMPLETE EVALUATION OF MT-X PROPOSALS SOON

Tokyo JPE AVIATION REPORT-WEEKLY in English No 530, 15 Jul 81 p 9

[Text]

The TR&DI will submit a report to the JDA's internal bureaus soon on its evaluation of proposals presented by MHI, KHI and FHI for the development of the ASDF's MT-X next-generation intermediate trainer starting in the current fiscal year.

The report will serve as the basis for the JDA's selection of a prime contractor and subcontractors for the seven-year MT-X program by September. The Air Staff Office has also participated in the TR&DI's evaluation to look into prospects for procurement, spare parts supply, deployment and technology. Its own evaluation report will be drafted by the end of August.

Before the final selection, the JDA will consult with the Ministry of International Trade and Industry (MITI) which has also started preliminary evaluation of the three proposals on its own. The selection will be based more on the views of the JDA rather than MITI.

The TR&DI is expected to earmark ¥1,900 million in the FY 1982 budget request in late August for detailed engineering for basic engineering. The MT-X program is to begin this autumn with the basic engineering.

CSO: 4120/279

BRIEFS

VSA SPECIAL TRAINER--The MSDF has decided to convert a trainer version of the P-2J antisubmarine patrol aircraft, under the FY 1981 budget, into a variable stability aircraft (VSA) as a special trainer. This aircraft is designed as a replacement of a P-2V-7 which was converted into a VSA by the TR&DI in 1977 for tests to collect technical data on future designs of large aircraft. The P-2V-7 VSA, now used for special flight training at the MSDF's 51st Air Squadron based in Shimofusa, Chiba Prefecture, will come to the end of its service life in several years. The conversion work will center on the transfer of the P-2V-7 VSA's equipment to the P-2J with limited airframe modification. The new VSA will not have a lateral wing on the main wing for direct lateral force control, although the wing is a symbolic feature of the P-2V-7 VSA. A main component for the P-2J VSA will be the fly-by-wire variable stability system. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English No 529, 8 Jul 81 p 10]

CSO: 4120/278

END

END OF
FICHE
DATE FILMED
31 JULY 1981